

Process for Treating Fine Coal Particles

Sub A1

Cross-References to related Applications

The benefit under Title 35 United States Code § 119(e) based on US Provisional application 60/142,779 filed July 8, 1999 is claimed.

Foreign priority is claimed under Title 35 United States Code § 119(a) (d) or § 365 (b) based on PCT application no PCT/CA00/00788 filed July 4, 2000.

Filed of the Invention

The present invention relates to the recovery of coal fines as a valuable product and the clarification of water for recycling from coal tailings permitting the use of a single stage unit operation.

Background to the Present Invention

A recognized challenge in coal industry is inefficient recovery of coal fines, compounded with the trend of producing more fines with continuous mining systems and subsequent coal preparation operations. Until very recent years, fine coals were merely washed to large volume of tailings stream, not only losing energy resources but also having some environmental consequences. Coal tailings typically contain less than 3% solids and about 60% of the solids are coal. Considering that a large quantity of water has to be treated before recycle or safe discharge to the environment, economics dictate that as much of the marketable coal as possible should be recovered from the tailings and water contained in the tailings be recycled if possible. From both economic and environmental considerations, the incentive to recover fine coal from a tailings stream (and/or use the water) is evident.

A few processes have been tested for recovering fine coals from tailings stream, including froth flotation and oil agglomeration. Although froth flotation featuring with microbubble technology had some success in recovering fine coals, thermal efficiency of the recovered coal is in general low due to the presence of surface moisture, encumbered by large surface areas (see for example NORTON, J., 1984. Finding the Economic Limit of Fine Coal Cleaning, Coal Mining, September, p. 38-40.). In addition, the discharge from flotation circuit remains to contain large amount of mineral matters including fine clays, which are difficult to remove by conventional filtration or thickening.

10019667.010202

Oil agglomeration, on the other hand, appears to be promising in recovering fine coals, as there is virtually no lower particle size limit and the ultimate floatability of coal is less affected by size compared to froth flotation (MEHROTRA, V.P., SASTRY, K.V.S. and MOREY, B.W., 1983. Review of Oil Agglomeration Techniques for Processing of Fine Coals, Int. J. Miner. Process. 11, p. 175-201.). An attractive feature of oil agglomeration process is a

A1
cont

10019667-010202